Oxygen surface exchange in $GdBaCo_2O_{5.5+\delta}$ (GBCO) epitaxial films explored by electrical conductivity relaxation

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$GdBaCo_2O_{5.5+\delta}$ (GBCO) is a promising material as cathode for solid oxide fuel cells and oxygen separation membranes since it has shown a fast oxygen diffusion and oxygen surface exchange coefficient in bulk polycrystalline samples, amongst the highest of the transition metal oxides with perovskite-related structure [1]. However, very little is known about the mechanism for such high catalytic effect for oxygen reduction, and which are the effective surface sites and plane cut for the reaction to take place. This work is an attempt to ascertain the role of crystal orientation and film stoichiometry in the surface exchange process on high quality epitaxial films obtained by pulsed laser deposition. Electrical conductivity relaxation technique is used in order to monitor the kinetics of the oxygen exchange process at different temperatures and oxygen partial pressures.

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References
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